

#2

FORM PTO-1300 (REV. 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				DN1999213 PCT (1065.0132)	
U.S. APPLICATION NO. (if known, see 37 CFR 1.5)					
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED			
PCT/US99/22799	15-10-1999 OCT 1, 99	19-10-1999			
TITLE OF INVENTION					
TWO-PIECE SEGMENTED TIRE MOLD					
APPLICANT(S) FOR DO/EO/US					
Gregory Lee Loney, David Chester Robek					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.</p> <p>4. <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p>a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input type="checkbox"/> has been communicated by the International Bureau.</p> <p>c. <input checked="" type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).</p> <p>a. <input type="checkbox"/> is attached hereto.</p> <p>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</p> <p>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input type="checkbox"/> have been communicated by the International Bureau.</p> <p>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p>d. <input checked="" type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> <p>Items 11 to 20 below concern document(s) or information included:</p> <p>11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input type="checkbox"/> A FIRST preliminary amendment.</p> <p>14. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>15. <input type="checkbox"/> A substitute specification.</p> <p>16. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.</p> <p>18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).</p> <p>19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</p> <p>20. <input type="checkbox"/> Other items or information:</p>					

FORM PTO-1390 (REV. 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			DN1999213 (1065.0132) U.S. APPLICATION NO. (if known, see 37 CFR 1.5) 09/980668
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED	
TITLE OF INVENTION TWO PIECE SEGMENTED TIRE MOLD			
APPLICANT(S) FOR DO/EO/US <u>Gregory Lee Loney, David Chester Robek</u>			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below. 4. <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31). 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> has been communicated by the International Bureau. c. <input checked="" type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). <ol style="list-style-type: none"> a. <input type="checkbox"/> is attached hereto. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4). 7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> have been communicated by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input checked="" type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)). 9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). 10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). 			
Items 11 to 20 below concern document(s) or information included:			
<ol style="list-style-type: none"> 11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 13. <input type="checkbox"/> A FIRST preliminary amendment. 14. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 15. <input type="checkbox"/> A substitute specification. 16. <input type="checkbox"/> A change of power of attorney and/or address letter. 17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825. 18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4). 19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). 20. <input type="checkbox"/> Other items or information: 			

U.S. APPLICATION NO. (if known) 09/980668

INTERNATIONAL APPLICATION NO.

ATTORNEY'S DOCKET NUMBER

21. ☐ The following fees are submitted:**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):**

Neither international preliminary examination fee (37 CFR 1.482)
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO
and International Search Report not prepared by the EPO or JPO. **\$1000.00**

International preliminary examination fee (37 CFR 1.482) not paid to
USPTO but International Search Report prepared by the EPO or JPO **\$860.00**

International preliminary examination fee (37 CFR 1.482) not paid to USPTO
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **\$710.00**

International preliminary examination fee (37 CFR 1.482) paid to USPTO
but all claims did not satisfy provisions of PCT Article 33(1)-(4) **\$690.00**

International preliminary examination fee (37 CFR 1.482) paid to USPTO
and all claims satisfied provisions of PCT Article 33(1)-(4) **\$100.00**

ENTER APPROPRIATE BASIC FEE AMOUNT =**CALCULATIONS PTO USE ONLY**

\$ 860 00

Surcharge of **\$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30
months from the earliest claimed priority date (37 CFR 1.492(e)).

\$ 000 00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	- 20 =		x \$18.00	\$ 000	00
Independent claims	- 3 =		x \$80.00	\$ 000	00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00	\$ 000	00
TOTAL OF ABOVE CALCULATIONS =				\$ 860	00
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.			+	\$	
SUBTOTAL =				\$ 860	00
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$ 000	00
TOTAL NATIONAL FEE =				\$ 860	00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$ 000	00
TOTAL FEES ENCLOSED =				\$ 860	00
			Amount to be refunded:	\$	
			charged:	\$	

\$ 000 00

\$ 000 00

\$ 000 00

\$ 000 00

TOTAL OF ABOVE CALCULATIONS =

\$ 860 00

☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.

\$

SUBTOTAL =

\$ 860 00

Processing fee of **\$130.00** for furnishing the English translation later than ☐ 20 ☐ 30
months from the earliest claimed priority date (37 CFR 1.492(f)).

\$ 000 00

TOTAL NATIONAL FEE =

\$ 860 00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **\$40.00** per property +

\$ 000 00

TOTAL FEES ENCLOSED =

\$ 860 00

Amount to be refunded:

\$

charged:

\$

- a. ☐ A check in the amount of \$ _____ to cover the above fees is enclosed.
- b. ☒ Please charge my Deposit Account No. 07-1725 in the amount of \$ 860.00 to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 07-1725A duplicate copy of this sheet is enclosed.
- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Frederick K. Lacher/Ronald P. Yaist
The Goodyear Tire & Rubber Company
Patent Dept. D/823
1144 East Market Street
Akron, Ohio 44316

Frederick K. Lacher
SIGNATURE

Frederick K. Lacher

NAME

16,502
REGISTRATION NUMBER

SEGMENTED TIRE MOLDTechnical Field

This invention relates to segmented tire molds and especially to molds having center segments which are movable radially in response to opening and closing of the mold.

Background of the Invention

Full segmented molds such as the mold shown and described in U.S. Patent No. 5,585,064 provide for expanding and contracting segments, however, the segments are mounted on the top mold and must be lifted to retract the segments. In addition to the added power required to lift the segments, the wear on the parts is also a disadvantage of this type of mold.

Other segmented molds, such as the mold shown in Great Britain Patent GB 1,176,162 provide hinged segments with springs for retracting the hinge pins of the segment. The tilt type segmented molds of this type do not provide for loading an uncured tire without engaging the bridge work on the segments. This is especially objectional for molds with curved segmental boundary designs where the mold segments must be retracted in a direction perpendicular to the vertical axis of the segments.

Summary of the Invention

The present invention is directed to a segmented mold having radially movable center segments which are mounted on the lower mold half. Each center segment has a slotted connection with a sloped surface of the upper mold half for retracting and then returning the segment to the registered position for molding a tire. The slot in the center segment is open at the top to permit opening of the mold without lifting of the segment. A spring holds the center segment in a radially outward position against a stop in the lower mold half which positions the slot for engagement with the upper mold half upon closing of the mold.

In accordance with one aspect of the invention there is provided a segmented tire mold having an upper mold half, a lower mold half and radially movable circumferentially spaced sliding segments characterized by:

- a. each of the sliding segments being mounted on the lower mold half for radial movement,
- b. a disengagable sliding connection between the upper mold half and each of the sliding segments for moving the segments radially of the mold between an open retracted position and a closed molding position.

In accordance with another aspect of the invention there is provided a method of vulcanizing a tire in a segmented tire mold having an upper mold half, a lower mold half and

radially movable circumferentially spaced center segments in sliding engagement with the lower mold half and slidably engagable with the upper mold half upon closing of the mold characterized by:

- a. opening the mold by lifting the upper mold half away from and out of sliding engagement with the center segments,
- b. moving the center segments radially outward by the sliding engagement with the upper mold half,
- c. limiting the movement of the center segments radially outward by stop means on the lower mold half,
- d. placing an unvulcanized tire on the lower mold half,
- e. lowering the upper mold half in sliding engagement with the center segments for moving the center segments radially inwards into engagement with the tire upon closing of the mold,
- f. applying heat to the tire mold to vulcanize the tire,
- g. lifting the upper mold half for sliding the center segments radially outward on the lower mold half, and
- h. removing the tire from the tire mold.

Brief Description of Drawings

Fig. 1 is a plan view of the lower mold half and the center segments embodying the invention.

Fig. 2 is a section of the mold embodying the invention taken along line 2-2 in Fig. 1 with parts being broken away to show the plunger and coil springs of the mold in the closed position.

Fig. 3 is a section like Fig. 2 showing the center segment in a partially retracted position.

Fig. 4 is an enlarged fragmentary sectional view of one of the centering pin connections between the lower mold half and the upper mold half taken along the plane of line 4-4 in Fig. 2.

Fig. 5 is an enlarged fragmentary sectional view of the lower mold half taken along the line 5-5 in Fig. 1 showing the stop means and spring pin for a center segment in the fully retracted position.

Fig. 6 is an enlarged fragmentary sectional view of the sliding connection between the upper mold half and one of the center segments taken along line 6-6 in Fig. 2.

Detailed Description of the Invention

Referring to Figs. 1 and 2, a segmental tire mold 10 is shown having a lower mold half 12, an upper mold half 14 and radially movable center segments 16. The lower mold half 12 and the upper mold half 14 have sidewall forming surfaces 18 and 20 respectively. The center segment 16 has tread forming surfaces 22, which are movable radially for disengaging the mold 10 from the tire after vulcanization.

Each of the center segments 16 is slidably mounted on a T-bar 24, fastened to the lower mold half 12 by bolts 26 or other suitable means. Each T-bar 24 extends radially of the mold 10 and slides in a slot 27 extending radially of the mold.

Each of the center segments 16 also have recesses 36 with end flanges 28 for plungers 30 mounted in sleeves 32 mounted on the lower mold half 12 and urged radially outward by coil springs 34 located between the recessed surface 36 in the lower mold half 12 and a flange 38 on the plunger 30. The coil springs 34 hold the center segments 16 in the fully retracted position after mold half 12 is pulled away from the center segments 16.

Referring to Fig. 6, a slot 40 is provided in a sloped surface 42 of the center segment 16 and has grooves 44 for receiving rollers 46 mounted on a shaft 48, supported by a bar member 50 which is bolted to the upper mold half 14 by a bolt 51. The slot 40 extends from a base surface 52 to a top edge 54 of the center segment 16. With this construction, lifting of the upper mold half 14 from the position shown in Fig. 2 to the position shown in Fig. 3 provides for travel of the rollers 46 upward through the grooves 44 pulling the center segments 16 radially outward to the position shown in Fig. 3.

Referring to Fig. 5, stop means, such as bolts 56 are located on the lower mold half 12 at spaced apart positions for limiting the radially outward movement of the center segments 16 beyond the partially open position shown in Fig. 3 to a position where the upper mold half 14 is lifted away from the lower mold half 12 and center segment 16 removing the rollers 46 from the grooves 44. The bolts 56 hold the center segments 16 in the position shown in Fig. 5 by springs 36 so that when the upper mold half 14 is lowered onto the center segment 16, the rollers 46 will be in alignment with and enter the grooves 40 for closing the mold 10.

Referring to Fig. 4, centering pins 58 are mounted in the lower mold half 12 at circumferentially spaced positions for registering in holes 60 in the upper mold half 14 when the upper mold is lowered into position over the center segment 16 and lower mold half 12.

The upper mold half 14 has shoulder forming surfaces 62 adjacent the sidewall forming surfaces 20 and the lower mold half 12 has shoulder forming surfaces 64 adjacent the sidewall

forming surfaces 18. Positioned between the shoulder forming surfaces 62 and 64 are the tread forming surfaces 22 on the center segments 16.

In addition to the lower mold half 12, upper mold half 12 and center segments 16, the segmental tire mold 10 also includes means for heating the molds and lifting and lowering the upper mold half 14. These services are well known in the art and are included in this disclosure, although not shown in the drawings or described herein.

In operation the segmental tire mold 10 is opened by lifting the upper mold half 14 away from the center segments 16 and lower mold half 12 causing the center segments 16 to retract to a partially open position shown in Fig. 3. The springs 36 move the segments 16 to the fully open position shown in Fig. 5. A green unvulcanized tire is then lowered into the lower mold half 12 and the upper mold half 14 lowered so that the centering pins 58 shown in Fig. 4 are registered in the centering pin holes 60. The grooves 44 in the center segments are then in position for receiving the rollers 46 of the segment bars 50 in the slots 40 of the center segments 16. Further lowering of the upper mold half 14 from the position shown in Fig. 3 to the position shown in Fig. 2 causes the tread forming surfaces 22 of the center segments 16 to move radially inward into the position shown in Fig. 2. During the closing of the mold 10, the springs 34 are compressed by movement of the flange 28 radially inward against the plungers 30. The segmental tire mold 10 is then in position for molding the tire upon the application of heat for a predetermined period of time.

After the tire is vulcanized, the mold 10 is opened by raising the upper mold half 14. This results in radially outward movement of the center segments 16 due to the action of each T-bar 24 in each slot 27 of each center segment. As the upper mold half 14 is lifted, the rollers 46 attached to the upper mold half engage the surfaces of the slot 40 in the center segments 16 urging them radially outward out of engagement with the cured tire tread. The upper mold half 14 may then be lifted away from the center segment 16 and lower mold half 12 for removal of the tire.

CLAIMS

1. A segmented tire mold having an upper mold half, a lower mold half and radially movable circumferentially spaced sliding segments, characterized by:

a. each of said sliding segments being mounted on said lower mold half for radial movement, and,

b. a disengagable sliding connection between said upper mold half and each of said sliding segments for moving said segments radially of said mold between an open retracted position and a closed molding position.

2. A tire mold in accordance with claim 1 further characterized by said disengagable connection comprising a plurality of spaced T-bars mounted on said upper mold half and engageable with a slot in each of said segments.

3. A segmented tire mold in accordance with claim 1 further characterized by a spring being mounted in said lower mold half and in engagement with each of said sliding segments for holding said segments in said open retracted position.

4. A tire mold in accordance with claim 1 further characterized by said disengagable connection comprising a T-bar mounted on said upper mold half in sliding engagement with a slot in each of said sliding segments.

5. A segmented tire mold in accordance with claim 4 further characterized by said T-bar having rollers for engagement with surfaces of said slot for reducing the sliding resistance of said second sliding connection.

6. A segmented tire mold in accordance with claim 1 further characterized by said lower mold half having circumferentially spaced centering pins extending upwardly for register in corresponding spaced-apart holes in said upper mold half.

7. A tire mold in accordance with claim 1 further characterized by stop members mounted on said lower mold half radially outward of said sliding segments for limiting radial movement upon opening of said mold.

8. A method of vulcanizing a tire in a segmented tire mold having an upper mold half, a lower mold half and radially movable circumferentially spaced center segments in sliding engagement with said lower mold half and slidably engageable with said upper mold half upon closing of said mold characterized by:

a. opening said mold by lifting said upper mold half away from and out of sliding engagement with said center segments,

b. moving said center segments radially outward by said sliding engagement with said upper mold half,

c. limiting said movement of said center segments radially outward by stop means on said lower mold half,

d. placing an unvulcanized tire on said lower mold half,

e. lowering said upper mold half in sliding engagement with said center segments for moving said center segments radially inwards into engagement with said tire upon closing of said mold,

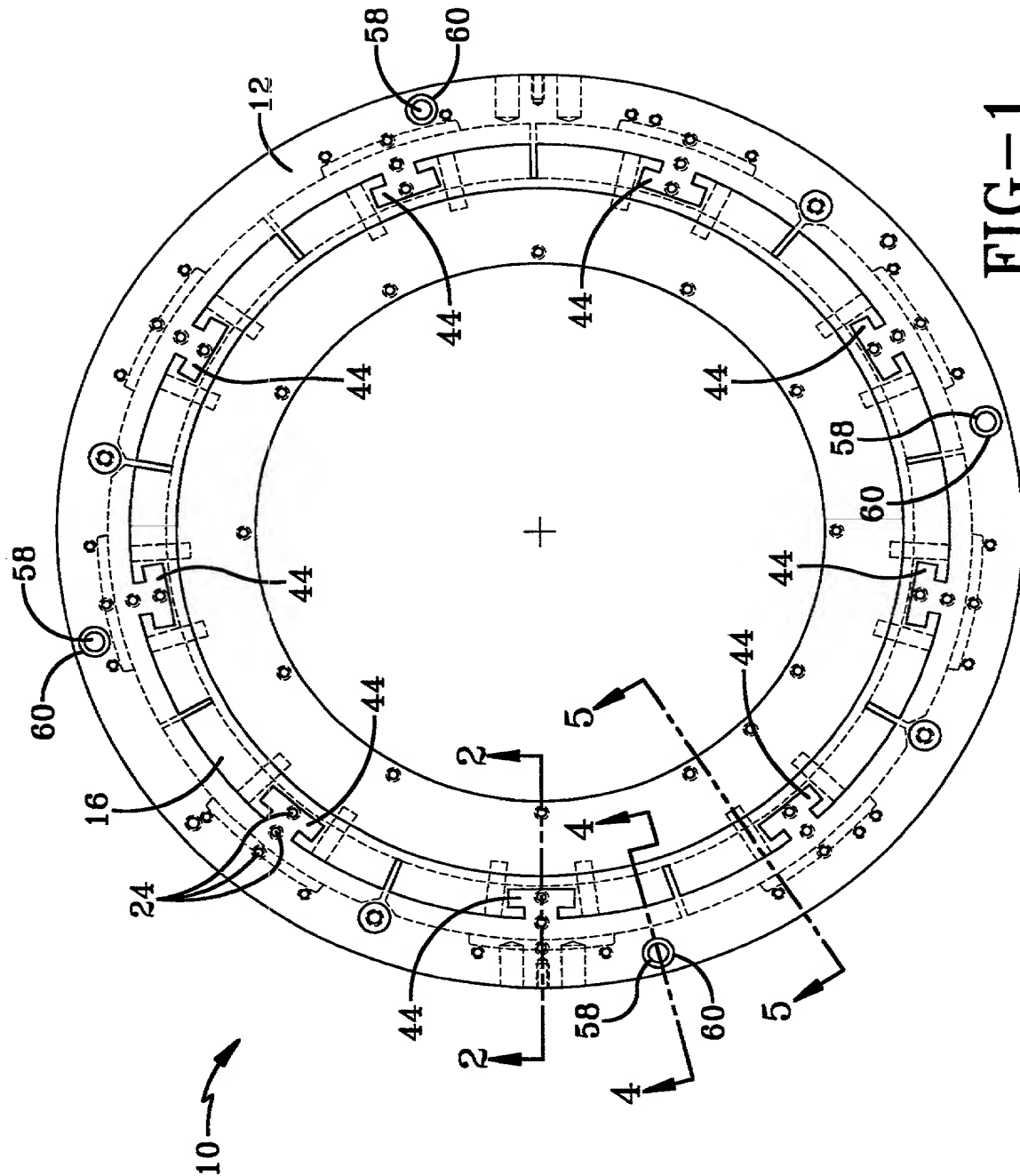
f. applying heat to said tire mold to vulcanize said tire,

g. lifting said upper mold half for sliding said center segments radially outward on said lower mold half, and

h. removing said tire from said tire mold.

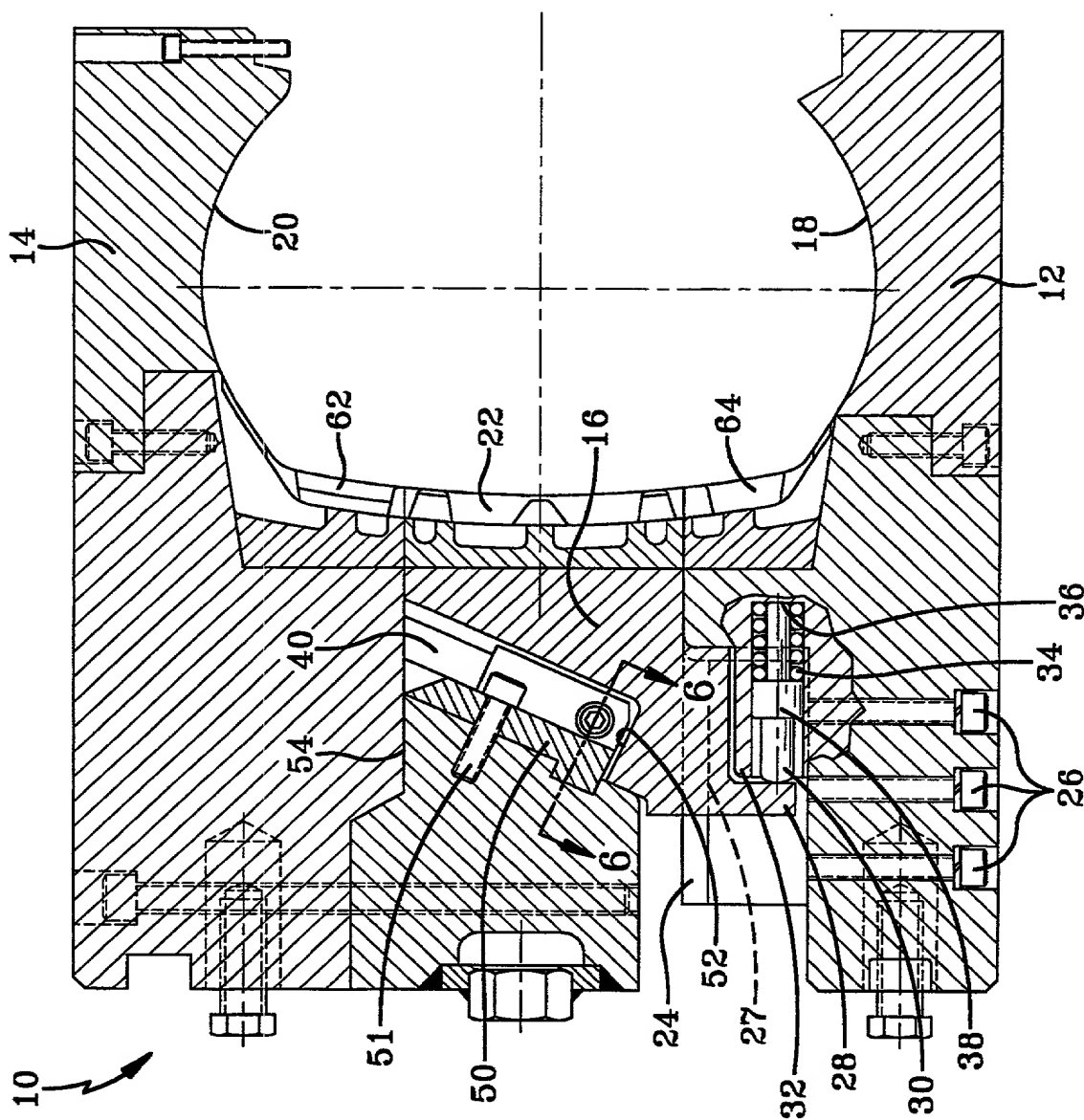
9. The method of claim 8 further characterized by retaining said center segments in a radially outward position by resilient means mounted on said lower mold half.

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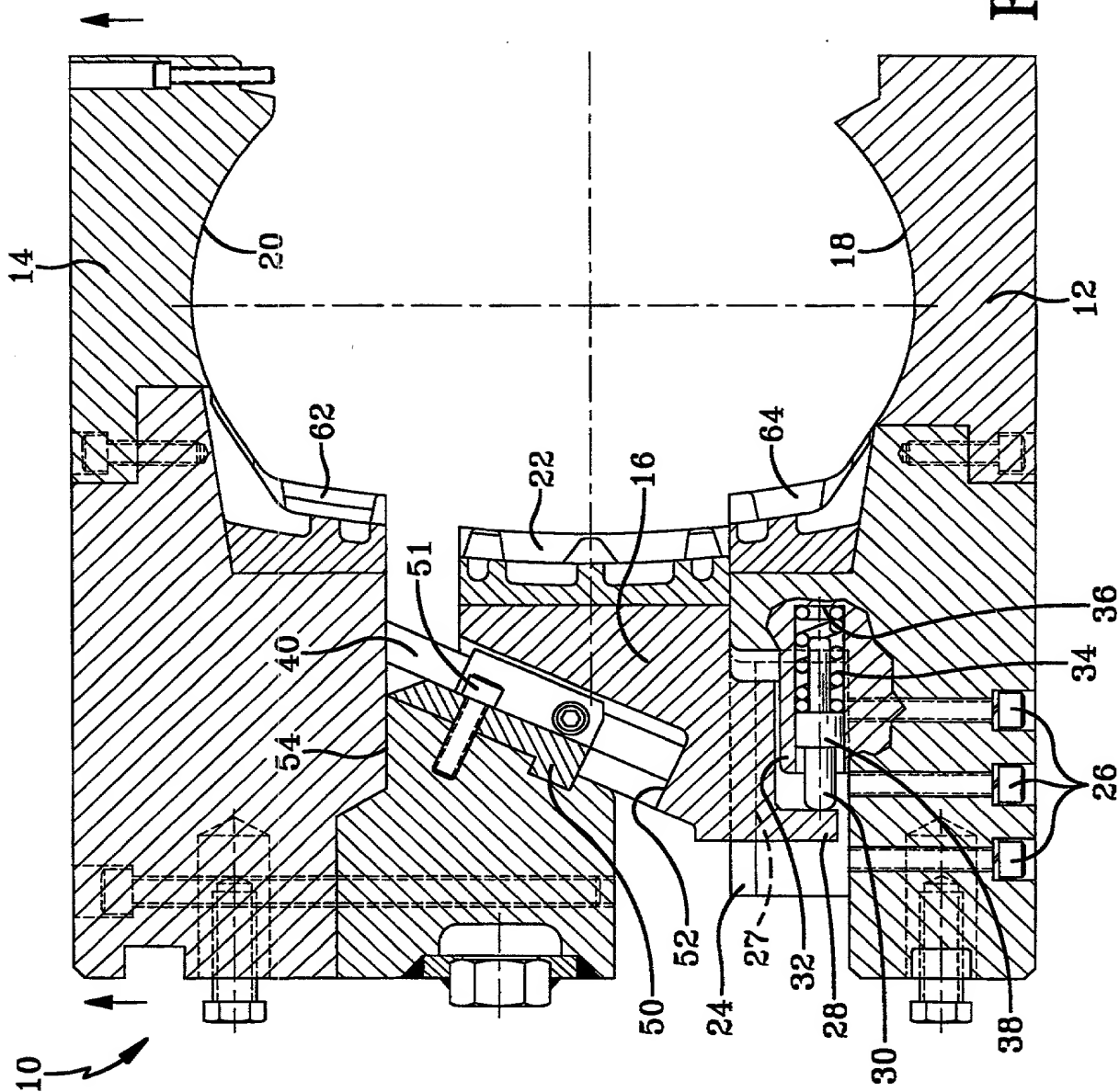
2/4

FIG-2



3/4

FIG-3



4/4

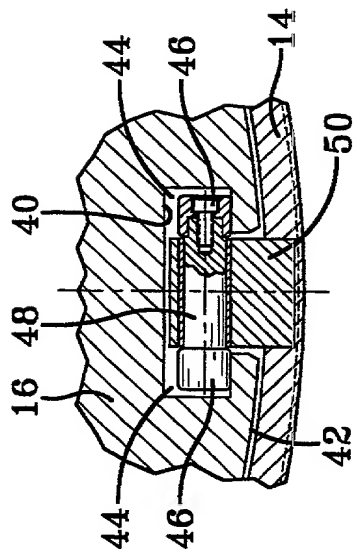


FIG-6

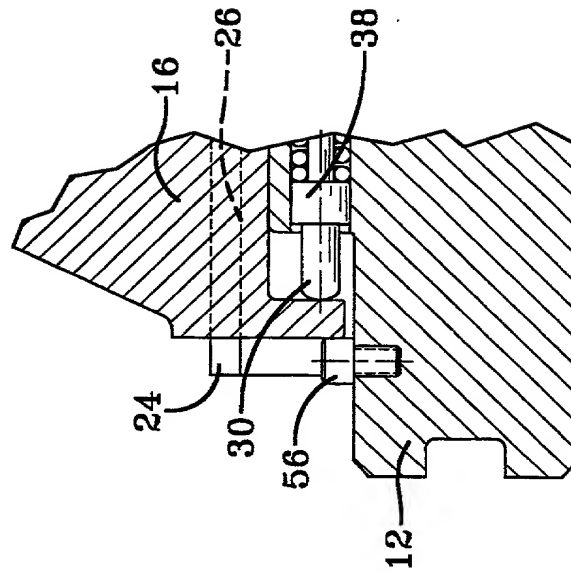


FIG-5

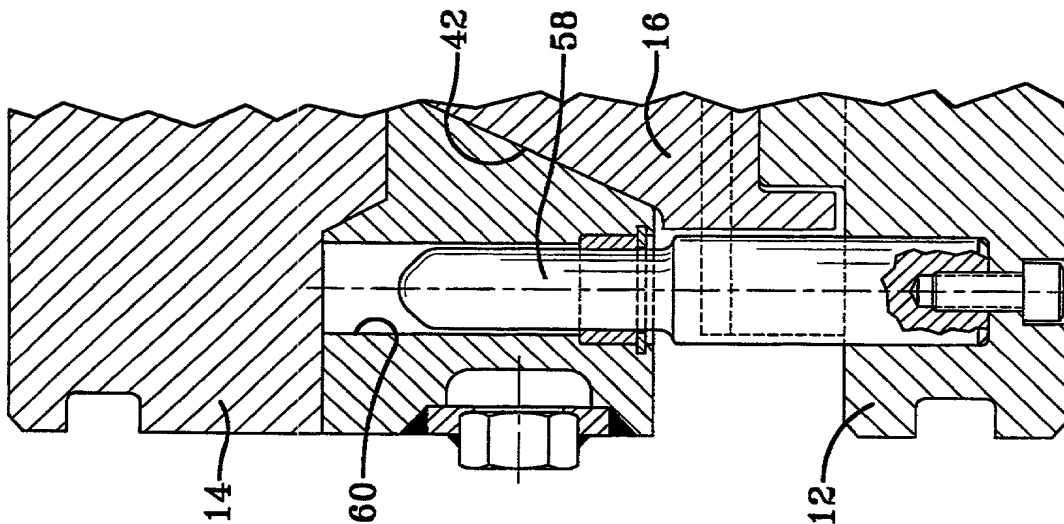


FIG-4

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **SEGMENTED TIRE MOLD** the specification of which (check one)

X is attached hereto.

_____ was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 C.F.R. §1.56.

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

(Application Serial No.)	(Filing Date)
(Application Serial No.)	(Filing Date)

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s) or §365 of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. §1.56 which become between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status)(patented, pending, abandoned)
(Application Serial No.)	(Filing Date)	(Status)(patented, pending, abandoned)

POWER OF ATTORNEY

As named inventor(s), I or we hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

Frederick K Lacher	Registration No.	<u>16,502</u>
Robert W Brown	Registration No.	<u>24,499</u>
Marc R Dion	Registration No.	<u>31,347</u>
Roger D Emerson	Registration No.	<u>33,169</u>

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statement may jeopardize the validity of the application or any patent issuing thereon.

Full name of sole or first inventor (given name, family name) Gregory Lee Loney
 Inventor's signature Gregory Lee Loney Date Sept. 29, 1999
 Residence Cuyahoga Falls, Ohio 44223 Citizenship US
 Post Office Address 2222 Stone Creek Trail, Cuyahoga Falls, Ohio 44223 US OH

Full name of second joint inventor, if any (given name, family name) David Chester Robek
 Inventor's signature David Chester Robek Date October 11, 1999
 Residence Cuyahoga Falls, Ohio 44223 Citizenship US
 Post Office Address 953 Elizabeth Court, Cuyahoga Falls, Ohio 44223 US OH

Full name of third joint inventor (given name, family name) _____
 Inventor's signature _____ Date _____
 Residence _____ Citizenship _____
 Post Office Address _____

Full name of fourth joint inventor, if any (given name, family name) _____
 Inventor's signature _____ Date _____
 Residence _____ Citizenship _____
 Post Office Address _____



Additional inventors are being named on separately numbered sheets attached hereto.

SEND CORRESPONDENCE TO:
 Frederick K Lacher
 c/o Robert W Brown
 The Goodyear Tire & Rubber Company
 Patent Dept., D/823
 1144 East Market Street
 Akron, Ohio 44316

DIRECT TELEPHONE CALLS TO:
 Frederick K Lacher
 (330) 535-5445